

# On word medial destressing : an account based on the principle of economy of derivation

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**On Word Medial Destressing:  
An Account Based on the Principle of Economy of Derivation\***

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**0. Introduction**

In the current stream of syntactic theory, economy principles which apply to both representations and derivations have attracted special attention (cf. Chomsky (1991, 1992)). The economy principles seem to have a kind of cognitively natural flavor and generality lacking in other specific principles of universal grammar. And the spirit of the principles must be accepted also in the grammatical explanation of various phenomena of linguistic components other than syntax. In this squib, taking notice of the length of derivational steps, I will demonstrate that a version of economy principles favoring minimal derivations, in interplay with other principles, can be used to dispense with the previous word medial destressing rules with complicated conditions.<sup>1</sup>

**1. Some Previous Studies on Medial Destressing**

First, consider the difference in stress contour between the examples in (1a) and those in (1b).

- (1) a. *èxplanáti*on (<expláin)  
      *pròvocáti*on (<provóke)  
      *dèriváti*on (<deríve)
- b. *àttèstáti*on (<attést)  
          *èxpèctáti*on (<expéct)  
          *rèlâxáti*on (<relâx)

All the nouns in (1) belong to a common class in that they are derived from the corresponding bisyllabic verbs with stress on the ultima. However, only in the words in (1b) does the antepenultimate vowel remain stressed, whereas the corresponding vowel in the examples of (1a) becomes lax and unstressed. Chomsky and Halle (1968) (=SPE) observe that vowel reduction takes place when no more than one consonant intervenes between the antepenultimate vowel and the following more strongly stressed vowel, while otherwise the

vowel in question remains stressed. Notice the difference in number of consonants between the italicized portions of (1a) and (1b). And they formulate the following rule as a part of what they call the Auxiliary Reduction Rule (p.125).

$$(2) V \rightarrow \begin{bmatrix} -\text{stress} \\ -\text{tense} \end{bmatrix} / VC_{\square} \begin{bmatrix} \overline{\alpha \text{ stress}} \\ +\text{tense} \end{bmatrix} C_{\square}^1 \begin{bmatrix} \beta \text{ stress} \\ V \end{bmatrix}$$

where  $\beta$  is 1, 2, or 3,  $\alpha$  is weaker than  $\beta$

Although destressing rules may well be formulated as in (2) in the framework of SPE, it seems that rule (2) should properly be counted merely as too complicated rather than just elaborate. Too many conditions are incorporated into one rule.<sup>2</sup>

After the shift of theoretical framework from an SPE-type linear theory to that of so-called nonlinear phonology, Hayes (1980: 260), for example, introducing the notions "projection", "foot" and "rime", proposes a rule of the form (3) called Pre-Stress Destressing as a destressing rule for such words as those in (1a).

$$(3) \quad F \rightarrow \phi / F \begin{array}{c} W \\ | \\ \text{---} \\ | \\ R \\ \wedge \\ VV \end{array} F$$

It is admirable that Hayes succeeded in formulating rules locally and eliminating the notion of variable. But rule (3) yet seems to be too full of conditions for a single rule.

Let us next look at another type of destressing rule. The italicized second heavy syllables of the examples in (4) receive stress by the application of the stress rules in English.

- (4) *légendàry, mómentàry, désultòry, inventòry, répertòry,*  
*infantile, sérpentine, gilbertite*

In words like those in (4), however, the second syllable becomes destressed despite the intervention of two consonants between the second and the third vowels (cf. (1)). Kiparsky (1979) notes that such words characteristically have a sonorant consonant in the position immediately following the second vowel, and gives the following Medial Destressing Rule (p.428).

(5)  $V \rightarrow [-\text{stressed}] / \acute{V}C\_\_\_ [+son]C\acute{V}$

This type of analysis where one rule is given for one phenomenon surely is quite easy to comprehend. Such an approach, however, seems dangerous in that it might force us to simply marshal specific rules and close our eyes to more satisfactory analyses made available under the alternative approaches and is inferior in theoretical adequacy to the approaches based on general principles applicable in many cases.

In the theory of Halle and Vergnaud (1987) supporting the grid representation, rule (5) is phrased in the following way (p.257).

(6) *Sonorant Destressing*

\* → . / \* \_ \*    line 1  
           \*\* \* \*\*    line 0

where # represents a word boundary

Condition: \_ dominates a rime ending with a sonorant.

The formal statement of rule (6) is elegant in the sense that phonetic/phonological features are eliminated from the representations of rule operation and rule environment. But it still seems to me that we will be able to dispense with all such applicational conditions and contexts as are specified in rule (6) and rules (2)-(5) by assuming modularization of a grammatical system. That is, the destressing phenomena can be explained, without using any complicated rules, by postulating the interaction of some basic and simple principles and some *independent* conditions.

## 2. A Proposal

Let us now see how some natural principles and simple secondary conditions would interplay to yield the stress patterns of words like those in (1) and (4).

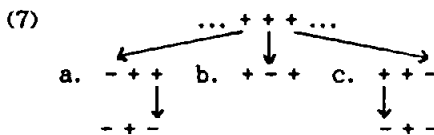
There is arguably a universal rhythmic ideal for stress-accent languages like English that favors a strict alternation of metrically strong and weak positions. Let us call this, following Selkirk (1984), the Principle of Rhythmic Alternation (PRA). The PRA requires that for such words as *explanation* ( + and - mean stressed and stressless, respectively ), in which

+   +   +   -

stress contiguity arises as a result of the application of the stress assignment rules, destressing should take place so as to avoid stress clash

and achieve eurhythmicity. In that case, the medial destressing rules need not stipulate which syllable(s) should be destressed. In other words, we need not state any environments of the medial destressing rules. It would be sufficient to state only the operational instruction of a rule, and the medial destressing rules seem reducible to the operation "Destress  $\alpha$ " analogous to the syntactic transformational rule "Move  $\alpha$ ".

The following diagram (7) shows three possible derivational processes to get alternating stress patterns from the prosodic structure where three stresses are contiguous.



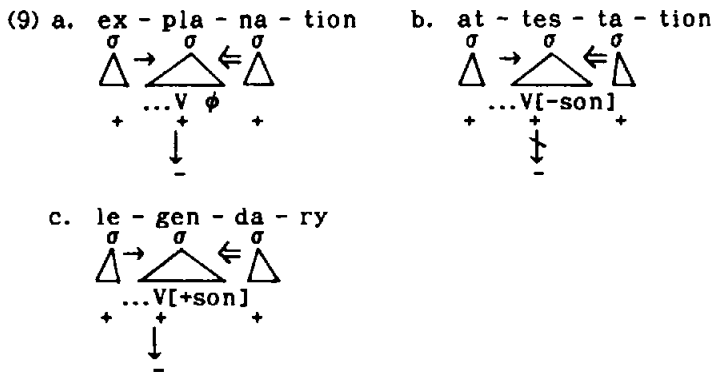
As shown in (7b), if we first reduce the medial stress, we can resolve stress clash by just one application of the destressing. However, if we begin to reduce the end stress, as in (7a, c), we must reapply the destressing to avoid a remaining stress clash. Therefore, in view of the Principle of Economy of Derivation (PED), we should give priority to the derivation in (7b) over the others. The PED invoked here can be formulated as follows:

- (8) Among a number of alternatives having the same legitimacy select that which has the shortest derivation.

The PED automatically chooses the least costly derivation (7b) without compelling us to designate the syllable to be destressed in the statement of the relevant rules.

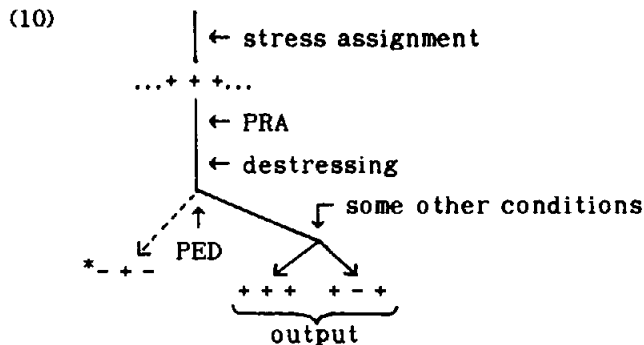
Finally, let us consider a secondary condition for medial destressing. The application of medial destressing can be affected by the number and kind of consonants existing in the "coda" of the syllable in question. As a result of a syllable being destressed, a certain segmental change occurs in its unstressed vowel. Specifically, the vowel reduces to a schwa. And the consonants following it, especially the coda consonants, play the role of a shock absorber for stress clash which triggers destressing (hence vowel reduction). As illustrated by the example in (9a), when there is no consonant in the coda of the second syllable and the vowel included in it is unprotectedly exposed to stress clash with the following adjacent syllable,

destressing is implemented.<sup>3</sup> On the other hand, as shown in example (9b), the coda consonant serves to soften the clash and thus blocks destressing. The example in (9c) undergoes destressing in spite of the existence of the coda consonant in the second syllable. This is because sonorant consonants such as /n/ have similar properties to vowels in that they behave just like the second element of a diphthong, thus being unable to function as a buffer lessening the effect of stress clash.<sup>4</sup>



### 3. Summary

Let us summarize the above discussion with a flowchart:



(i) If stress clashes arise as a result of the application of the stress rules, the PRA demands that those clashes be resolved; (ii) In order to avoid stress clash, some syllable(s) should be destressed; (iii) The PED decides which syllable(s) become unstressed; (iv) Lastly, destressing is subject to certain secondary conditions related to some syllable structure and

segmental properties.

## NOTES

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<sup>1</sup> Since I aim to make a new proposal for accounting for destressing phenomena, I omit to detail my procedure for stress assignment. To be brief, however, I mainly follow Hayes (1980, 1982) and presuppose cyclic application of the rules and the following rules: (i) Long Vowel Stressing which stresses final syllables containing long vowels, (ii) Extrametricality in nouns and in certain suffixes, (iii) English Stress Rule which stresses the rightmost syllable with branching rime, and (iv) Stress Retraction which locates subsidiary stresses.

<sup>2</sup> In the original forms of rule (2) and rule (3), the latter of which we will examine next, further conditions and brackets are added in order to handle also word initial destressing, e.g., *solidity*, *contain*. I omit here such conditions and brackets, however, because the subject for the present discussion is about word medial destressing.

<sup>3</sup> Arrows ( →, ← ) represent stress clashing. The right-hand arrow is emphasized here in order to indicate that the stress clash between the second syllable and the following, rather than the preceding, one is crucial. The symbol " σ " represents a syllable.

<sup>4</sup> Cf. Selkirk (1982) and Ohta (1986), where it is argued that sonorant consonants may be the second element of the syllable peak.

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